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81-10106
CR-164100

**SECOND QUARTERLY REPORT
FOR
GEOMAGNETIC FIELD MODELING
BY OPTIMAL RECURSIVE FILTERING**

(881-10106) GEOMAGNETIC FIELD MODELING BY
OPTIMAL RECURSIVE FILTERING Quarterly
Report, 1 Oct. - 31 Dec. 1980 (Business and
Technological Systems, Inc.) 3 p
HC A02/MF A01

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For the Period

October 1, 1980 - December 31, 1980

Submitted to

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER
Greenbelt, Maryland 20771**

by

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RECEIVED

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TYPE II

A) PROBLEMS

None

B) ACCOMPLISHMENTS

1) Mini-Batch Models

Five individual 5-year "mini-batch" geomagnetic models (covering the years 1950-1976) were generated using the data sets described in the previous progress report. The maximum degree of the spherical harmonic expansions used in the models was:

<u>Data Span</u>	<u>Maximum Degree</u>	
	<u>Constant</u>	<u>Linear</u>
1950-1955	9	6
1955-1960	10	7
1960-1965	13	13
1966-1970	13	13
1970-1976	13	13

2) Software Developed

Two computer programs were developed to process the "mini-batch" models. The first program computes statistics (e.g., mean sigma, weighted sigma) on the changes in the first derivatives (linear terms) of the spherical harmonic coefficients between mini-batches. This program has been run successfully. These statistics will be used to compute the state noise matrix required in the information filter. The second program is the information filter (described in our proposal). Most of the subroutines used in the filter have been tested, but the filter will not be run until an analysis of coefficient statistics is completed.

C) SIGNIFICANT RESULTS

None

D) PUBLICATIONS

None

E) RECOMMENDATIONS

None

F) FUNDS EXPENDED

Total Project	31.1
Prior Expenditure	1.3
Expenditure this Period	7.9
Total Expenditure to Date	9.2
Amount Remaining	21.9
Amount Next Period (est.)	6.0

G) DATA UTILITY

Not applicable.